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(71) Applicant and

(72) Inventor: DANIELSSON, Niklas [SE/SE]; Klippgatan 8  
B, S-171 47 Solna (SE).

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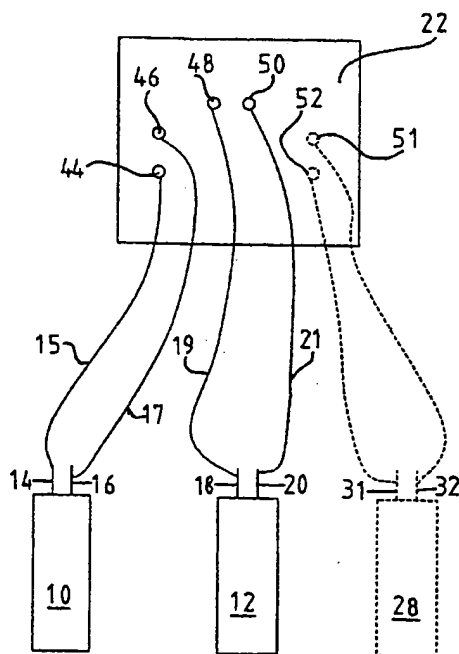
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(74) Agents: BERGLUND, Stefan et al.; Bjerkéns Patentbyrå  
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(54) Title: COMPUTER SECURITY DEVICE FOR HARD DISC PROTECTION



(57) Abstract: The invention concerns a computer device (8) which comprises at least two memory units (10, 12). The memory units (10, 12) are of the kind the function of which in the computer device at least partly is determined by whether electric connection is the case between two contact surfaces (14, 16; 18, 20) of the memory unit (10, 12). The computer device (8) also comprises a switching device (22). The switching device (22) is connected with the two contact surfaces (14, 16) of at least a first (10) of the memory units (10, 12). The electric connection between the two contact surfaces (14, 16) of the first memory unit (10) may be opened and closed with the switching device (22). The function of the first memory unit (10) is thus determined by whether the switching device (22) is set for closure of opening of the connection between the contact surfaces (14, 16).

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## 5      **COMPUTER SECURITY DEVICE FOR HARD DISC PROTECTION**

### **BACKGROUND OF THE INVENTION AND PRIOR ART**

The present invention concerns a computer device comprising:  
10      at least two memory units, wherein each of these memory units comprises at least two contact surfaces and is of the kind the function of which in the computer device at least partly is determined by whether an electric connection is the case between these two contact surfaces of the memory unit, and at least one  
15      manually operable switching device which allows for setting for closure and opening of at least one connection.

Such a known computer device may for example be a personal computer (PC). Such a PC comprises sometimes for example two  
20      hard disc units which thus form two memory units. One hard disc unit may for example function as master and the other hard disc unit may function as slave. The hard disc units are often of the kind that comprises a plurality of contact pins which may be connected in pairs by means of a clamp (a so-called jumper). By connecting  
25      two predetermined pins with a clamp, a hard disc unit may for example be defined as master. When the computer device comprises two such hard disc units, one is therefore often defined as master and the other as slave by means of said clamps. Further a computer device sometimes comprises a switching device which  
30      allows for setting for closure and opening of a connection by means of a key. The connection which may be closed and opened may thereby simply be the line voltage to the computer device. This means that someone who does not have access to the key may not start or use the computer device.

35      A computer device with two hard disc units is known through the document CA 2 197 502. The document describes a computer

device with a switch. With the switch it may be selected which of the two hard disc units that is to be connected. The other hard disc unit can thereby not be used. For the switching one or two keys may be used. The switching device is relatively complicated and  
5 comprises a circuit which is connected to the common control and address line of the computer device and to two tristate buffers. These buffers are in their turn connected to the hard disc units via two matching circuits.

10 The document US-A-5 434 562 describes a computer device which may have a plurality of connected peripheral units. The document describes different manners in which a user may have access to the different units. In the simplest case the access to a unit is determined by closing or opening of the line voltage. In other cases  
15 a more complicated circuit is used for influencing different control signals to or from a control unit (controller).

The above-described devices are thus either relatively complicated or use only the switching of the line current or line voltage.  
20

There is a need for the possibility to in simple manner being able to define the function of a memory unit in a computer. For example, it may be the case that for example children in a family use a computer in the absence of the parents. The children may thereby  
25 when playing cause problems in programs which are stored on the hard disc. Through the programs that the children use for example viruses or the like may infect the hard disc. It may thus be desirable to prevent people without a permission, for example the children, from using at least a certain hard disc in the computer.

30

## SUMMARY OF THE INVENTION

The purpose of the present invention is to achieve a computer device which with a very simple construction makes the switching of  
35 memory units which are comprised in the computer device possible. For example, it may be advantageous if different users of the computer device use different memory units. An advantage with the

present invention is that thereby the contact surfaces which already exist on the memory units are used.

5 The purpose of the invention is achieved with the computer device as initially defined which is characterised in that said switching device is connected to the two contact surfaces of at least a first of the memory units, such that the electric connection between the two contact surfaces of said first memory unit may be opened and closed by the switching device, wherein said function of said first  
10 memory unit is determined by whether the switching device is set for closure or opening of the electric connection between the two contact surfaces of said first memory unit. The switching device thus directly controls the closure and the opening of the connection between the contact surfaces which are located on the memory  
15 unit. No complicated circuits are thereby needed between the switching device and the contact surfaces of the memory unit. Preferably the switching device is thus directly connected to said contact surfaces without there being any further circuit between the switching device and the contact surfaces.

20 According to an embodiment of the invention, said switching device comprises a locking device which limits the possibility for a user of the computer device to set the switching device for closure or opening. Hereby is made possible that only the one who has access  
25 to the locking device may determine whether a closure or an opening should be the case between the contact surfaces.

According to a further embodiment of the invention, said locking device is arranged to be operated by means of a key. Only  
30 someone who has access to the key may thus switch the switching device. Instead of a key it is also possible to arrange the locking device with some kind of code.

According to still another embodiment of the invention, said  
35 switching device is also connected to the two contact surfaces of a second of the at least two memory units, such that the electric connection between the two contact surfaces of the second memory

unit may be opened and closed with the switching device, wherein the switching device is arranged to comprise at least a first and a second setting position, wherein at the first setting position the electric connection between said two contact surfaces of the first memory unit is closed, and wherein at the second setting position the electric connection between said two contact surfaces of the second memory unit is closed. The two contact surfaces of the respective memory unit may thereby for example define which of the memory units that should be connected and that may be used in the computer device. When the switch is set according to a first setting position, the first memory unit may thus be used. When the switching device is set to a second setting position, the second memory unit may be used.

According to still another embodiment of the invention, said locking device is arranged such that said first and second setting position comprise two different locking positions which may be set by means of said key. This means that somebody who has access to the key may select which of the two setting positions that the switching device is to be set at. For example, when the parents leave the computer device they may with the help of the key set the switching device such that only a certain memory unit may be used. The children may then be free to use the computer device and thereby have access to this memory unit. Another memory unit, which usually is used by the parents, the children will thereby not have access to.

According to a further embodiment of the invention, the switching device is arranged to comprise at least also a further setting position, wherein in this further setting position the electric connection between the two respective contact surfaces with which the switching device is connected is open at all memory units to which the switching device is connected. With the switching device set in this further setting position, booting can be prevented from all memory units. When for example the locking device is arranged to be operated with a key, this means that someone who does not

have access to the key may not use the computer device if the switching device is set in this further setting position.

5 According to another embodiment of the invention, said first and second memory units are hard disc units. The function of the hard disc units in the computer device may thereby be determined by switching with the help of the switching device.

10 According to a further embodiment of the invention, said two contact surfaces of said first and second memory unit consist of two pins which are of the kind which are arranged to be connectable by means of a clamp. Such pins are for example arranged on hard disc units. These pins are thereby of a standard type and may be connected to each other by means of a clamp (a so-called jumper).

15 According to still another embodiment of the invention, the computer device comprises at least a housing, wherein said switching device is arranged at the housing and arranged to be able to be set from the outside of the housing. It is of course  
20 advantageous if the switching device in a simple manner may be operated by a user. An advantageous position of the switching device is thus at the housing of the computer device.

25 According to a further embodiment of the invention, the computer device is arranged such that setting of the switching device in a first position means that the first of said memory units is connected for use in the computer device while the second memory unit is not connected for use. Suitably, but not necessarily, the computer device is also arranged such that setting of the switching device in  
30 a second position means that the second memory unit is connected for use while the first memory unit is disconnected and may thus not be used.

35 According to still another embodiment of the invention, the computer device is arranged such that setting of the switching device in a first position means that both the first and the second memory unit are connected for use in the computer device, wherein

the first memory unit functions as master and the second memory unit or memory units function as slave. Preferably, the switching device may hereby comprise a second position, where also both the first and the second memory unit are connected for use in the computer device, but where the second memory unit functions as master and the first memory unit functions as slave. Suitably, the computer device may be arranged in this manner in that the switching device is connected to predetermined contact surfaces of the memory units and in that it has been defined in the set-up of the computer that one of the memory units functions as master and the other as slave.

#### SHORT DESCRIPTION OF THE DRAWINGS

The present invention will now be explained with the help of an embodiment given as an example and with reference to the appended drawings.

Fig 1 shows schematically a computer device according to the invention.

Fig 2 shows, also schematically, a switching device connected to memory units.

Fig 3 shows schematically a front view of an example of the switching device.

#### DETAILED DESCRIPTION OF AN EMBODIMENT OF THE INVENTION

Fig 1 shows schematically a computer device 8. The computer device 8 is in this case a personal computer (PC), but also other kinds of computers may be constructed in accordance with the present invention. The computer device 8 comprises a housing 26. A switching device 22 is arranged at the housing 26. The switching device 22 may thus be reached and set from the outside of the housing 26. The switching device 22 comprises a locking device 23. The locking device 23 is in this case of the kind which is operated with the help of a key 24. The locking device 23 thus requires that a



user has access to a key 24 in order to be able to set the switching device 22.

Fig 2 shows schematically two memory units 10, 12. These memory units 10, 12 constitute for example two hard disc units 10, 12. These hard disc units 10, 12 are suitably arranged inside the housing 26 of the computer device 8. It is also possible that the computer device 8 comprises more than two hard disc units 10, 12. A further such hard disc unit 28 is indicated by a broken line. Each of the memory units 10, 12 comprises at least two contact surfaces 14, 16 and 18, 20, respectively. These contact surfaces 14, 16, 18, 20 constitute preferably two pins which are of the kind which are arranged to be connectable by means of a clamp (a so-called jumper). Such pins 14, 16, 18, 20 are often of a standard kind and a memory unit is usually equipped with several such pairs of pins 14, 16, 18, 20 which are connectable with a clamp. By connecting a certain pair of such pins 14, 16 may for example be defined that the memory unit 10 constitutes the master unit in the computer device 8. Other pairs of pins may define other functions of the memory unit in question. The indicated memory unit 28 also has at least one such pair of pins 31, 32. The function of the memory unit 10, 12, 28 in the computer device 8 is thus determined at least partly by whether electric connection is the case between the two contact surfaces 14, 16; 18, 20; 31, 32.

Furthermore, it may also be defined in the set-up of the computer device 8 which function a certain memory unit 10, 12, 28 has in the computer device 8 when predetermined pins are connected to each other. For example, the computer device 8 may thereby be arranged such that if predetermined pins on a certain memory unit are connected to each other, then the memory unit in question is connected for use in the computer device while the other memory unit or memory units are disconnected and may thus not be used. Alternatively, it may be defined in the set-up of the computer that a certain memory unit, when predetermined pins of this memory unit are connected to each other, functions as master and the other memory units function as slave. This means, inter alia, that booting

of the computer device 8 is done from the memory unit which functions as master.

5 The computer device 8 also comprises a switching device 22. The switching device 22 may for example be of a so-called key switch kind. This means that the switching device 22 is operable with the help of the key 24. In Fig 2 is schematically shown how such a switching device 22 may function. The switching device 22 comprises a plurality of poles 42, 46, 48, 50, 51, 52. These poles  
10 are according to this embodiment arranged in pairs (by a pair of poles is in this application meant two contact surfaces of the switching device between which a connection may be closed or opened with the switching device). If the key 24 is set in a certain position, the poles 44 and 46 are connected to each other. If the  
15 key is set in a second position, the connection between the poles 48 and 50 is closed. The switching device 22 may also comprise further poles such as is indicated by 51 and 52. By manual setting with the help of the key 24, the switching device 22 may thus be set for closing and opening of the different pairs of poles 44, 46; 48, 50;  
20 51, 52.

The two poles 44, 46 of the switching device 22 are via lines 15, 17 connected to the two contact surfaces 14, 16 of a first 10 of the memory units. If the key 24 of the locking device 23 is set in a first  
25 position which closes the connection between the poles 44 and 46, then thereby also the connection between the pins 14, 16 of the memory unit 10 is closed. The function of the first memory unit 10 is thereby determined by whether the switching device 22 is set for closing or opening of the electric connection between the two pins  
30 14, 16 of the memory unit 10. According to the simplest embodiment of the invention, only the connecting lines 15, 17 are needed between the switching device 22 and a memory unit 10. This memory unit 10 may thereby thus be connected and disconnected with the help of the key 24.

35 According to the shown embodiment the poles 48, 50 of the switching device 22 are connected via lines 19, 26 to the pins 18,

20 of a second memory unit 12. The switching device 22 may thereby with the help of the key 24 be set in a second position where the poles 48, 50 are electrically connected to each other. This means that the pins 18, 20 of the second memory device 12 are connected to each other. When the key is set in this position, the connection between the poles 44, 46 is open and thereby also the connection between the pins 14, 16 is open.

By setting the key 24 in a first position thus for example only the memory unit 10 may be connected while the memory unit 12 is disconnected. By setting the key 24 in a second position, the memory unit 12 may be connected while the memory unit 10 is disconnected. Alternatively, one memory unit 10 may in a first position function as master while the other memory unit 12 functions as slave and vice versa in a second setting position. The switching device 22 may also comprise a further setting position. This further setting position may be such that when the switching device 22 is set in this position, the connection is open between the two pins 14, 16; 18, 20 and 31, 32, respectively, at all memory units 10, 12, 28 which are connected to the switching device 22. With the switching device 22 set in this further position for example no booting can be performed.

Fig 3 shows schematically how the locking device 23 of the switching device 22 may look to a user of the device. The switching device 22 may suitably be arranged in a holding member 25. This holding member 25 may for example be adapted to be arranged in a standard position in a computer. The device may be provided with a first indication mark 27 and a second indication mark 29. The two indication marks 27, 29 may differ from each other by for example having different colours, different patterns or comprise different symbols. In order to allow for a simple installation of the switching device 22, the lines 15, 17 and 19, 21, respectively, (see Fig 2) may suitably have corresponding indications to the indication marks 27, 29. The lines 15, 17, which lead to a memory unit 10, may form part of a common cable or may be twisted together. This cable or these lines 15, 17 may thereby for example comprise a certain colour

which corresponds to the colour of the first indication mark 27. In the corresponding manner, the lines 19, 21 may comprise another colour which corresponds to the colour of the second indication mark 29. The locking device 23 may also have a neutral position  
5 where the key 24 is set such as is shown in Fig 3. Possibly, a third indication mark 30 may indicate this neutral position. This neutral position may for example be the above described further setting position, in which the connection is open between the pins 14, 16; 18, 20; 31, 32 of all memory units 10, 12, 28.

10

When the key 24 is turned to the left, i.e. towards the first indication mark 27, suitably the lines 15, 17 which have the corresponding indication as the indication mark 27 are short-circuited. If the key 24 is turned to the right, i.e. towards the second indication mark 29,  
15 suitably the connection between the lines 19 and 21 which have the corresponding symbol to the second indication mark 29 is closed.

The present invention makes a very simple solution possible to the problem to by means of a lock being able to define the function of a  
20 certain memory unit, for example a hard disc unit. Since the contact surfaces, i.e. the pins 14, 16, 18, 20, already are arranged on the hard disc unit, it is according to the invention only necessary to draw lines 15, 17, 19, 21 from these pins 14, 16, 18, 20 to the switching device 22. No further electronic circuitry is necessary  
25 between the pins 14, 16, 18, 20 and the switching device 22.

As an example of an application of the invention may be mentioned that it may be the case that different users, for example colleagues at work, who use the same computer, want to use different hard  
30 disc units in order not to risk to manipulate each others programs. According to the invention, it may thus in a simple manner with the help of the switching device be set which of the hard disc units that is to be connected. The different users may thereby use their own hard discs and therefore do not risk causing any changes in that  
35 which is stored on the hard discs of the other users.

The present invention is not limited to the shown embodiment but may be varied and modified within the scope of the following claims. As has been described above, it is possible that the locking device comprises a setting position where none of the memory units is connectable. Furthermore, the locking device may be arranged to be operated with different keys which give access to different memory units: with a first key the switching device may be set in a first position and with another key the switching device may be set in a second position.

10

Claims

1. A computer device (8) comprising:  
at least two memory units (10, 12), wherein each of these memory  
5 units (10, 12) comprises at least two contact surfaces (14, 16; 18,  
20) and is of the kind the function of which in the computer device  
(8) at least partly is determined by whether an electric connection is  
the case between these two contact surfaces (14, 16; 18, 20) of the  
memory unit (10, 12), and  
10 at least one manually operable switching device (22) which allows  
for setting for closure and opening of at least one connection,  
characterised in that  
said switching device (22) is connected to the two contact surfaces  
(14, 16) of at least a first (10) of the memory units, such that the  
15 electric connection between the two contact surfaces (14, 16) of  
said first memory unit (10) may be opened and closed by the  
switching device (22), wherein said function of said first memory  
unit (10) is determined by whether the switching device (22) is set  
for closure or opening of the electric connection between the two  
20 contact surfaces (14, 16) of said first memory unit (10).
2. Computer device (8) according to claim 1, wherein said  
switching device (22) comprises a locking device (23) which limits  
the possibility for a user of the computer device (8) to set the  
25 switching device (22) for closure or opening.
3. Computer device (8) according to claim 2, wherein said locking  
device (23) is arranged to be operated by means of a key (24).
- 30 4. Computer device (8) according to any one of the preceding  
claims, wherein said switching device (22) is also connected to the  
two contact surfaces (18, 20) of a second (12) of the at least two  
memory units (10, 12), such that the electric connection between  
the two contact surfaces (18, 20) of the second memory unit (12)  
35 may be opened and closed with the switching device (22), wherein  
the switching device (22) is arranged to comprise at least a first and  
a second setting position, wherein at the first setting position the

electric connection between said two contact surfaces (14, 16) of the first memory unit (10) is closed, and wherein at the second setting position the electric connection between said two contact surfaces (18, 20) of the second memory unit (12) is closed.

5

5. Computer device (8) according to claim 3 and 4, wherein said locking device (23) is arranged such that said first and second setting position comprise two different locking positions which may be set by means of said key (24).

10

6. Computer device (8) according to claim 4 or 5, wherein the switching device (22) is arranged to comprise at least also a further setting position, wherein in this further setting position the electric connection between the two respective contact surfaces (14, 16; 18, 20; 31, 32) with which the switching device is connected, is open at all memory units (10, 12, 28) to which the switching device (22) is connected.

15

7. Computer device (8) according to any one of the preceding claims, wherein said first (10) and second (12) memory units are hard disc units.

20

8. Computer device (8) according to any one of the preceding claims, wherein said two contact surfaces (14, 16; 18, 20) of said first (10) and second (12) memory unit consist of two pins which are of the kind which are arranged to be connectable by means of a clamp.

25

9. Computer device (8) according to any one of the preceding claims, comprising at least a housing (26), wherein said switching device (22) is arranged at the housing (26) and arranged to be able to be set from the outside of the housing (26).

30

10. Computer device (8) according to any one of the preceding claims, wherein the computer device (8) is arranged such that setting of the switching device (22) in a first position means that the first (10) of said memory units is connected for use in the computer

35

device (8), while the second (12) memory unit is not connected for use.

11. Computer device (8) according to any one of the preceding  
5 claims, wherein the computer device (8) is arranged such that  
setting of the switching device (22) in a first position means that  
both the first (10) and the second (12) memory unit are connected  
for use in the computer device (8), wherein the first memory unit  
(10) functions as master and the second memory unit or memory  
10 units (12) function as slave.



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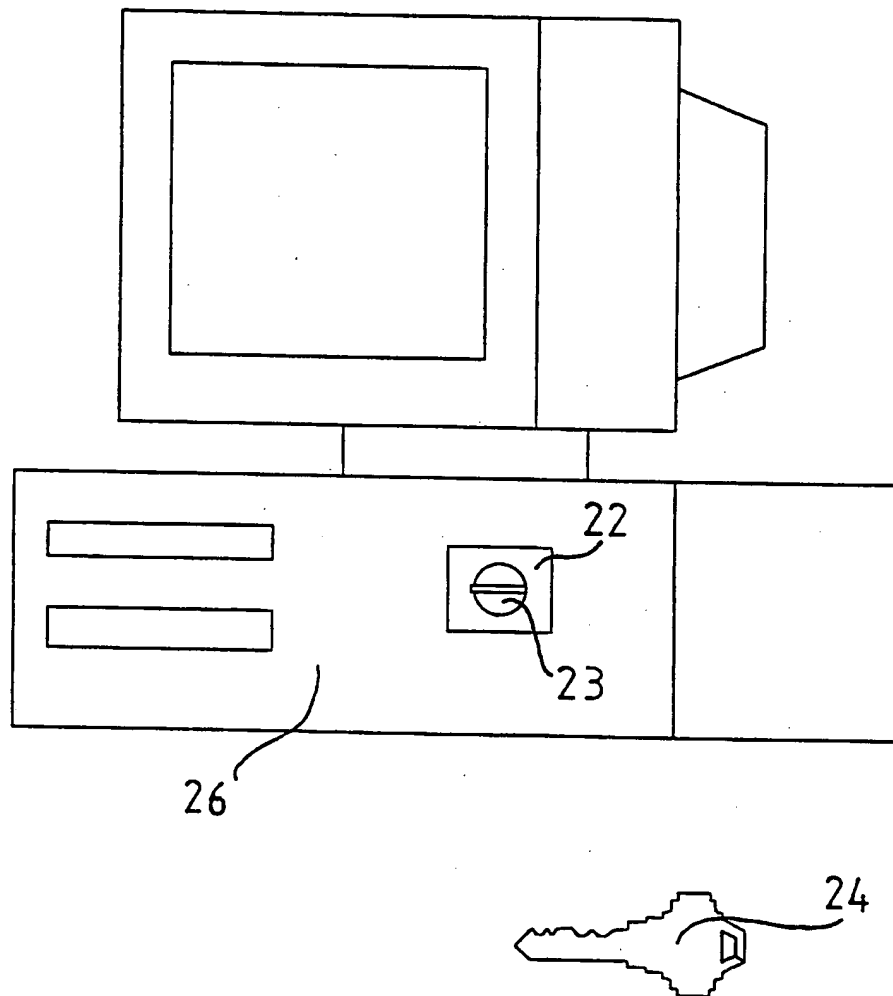
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FIG 1

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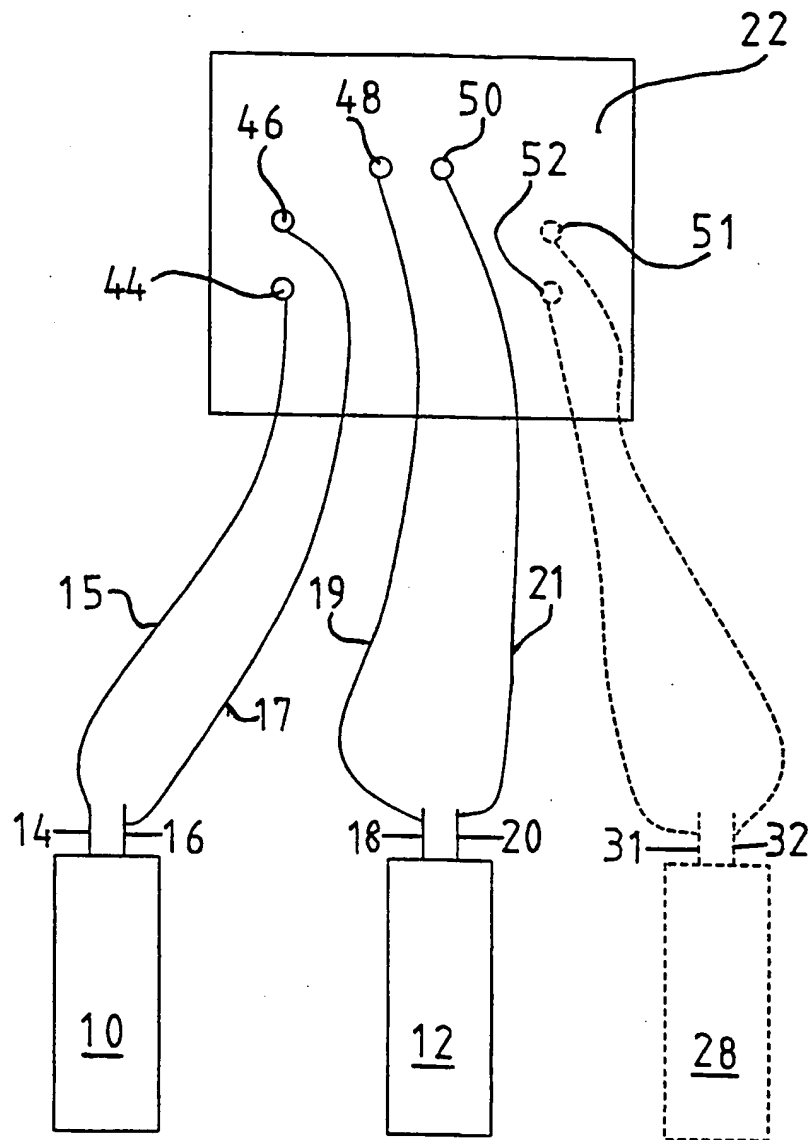


FIG 2

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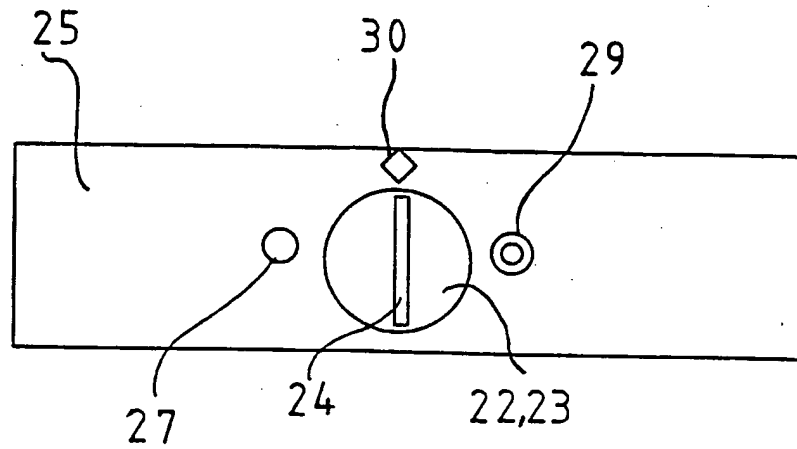


FIG 3

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 00/01567

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G06F 1/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

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IPC7: G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2279163 A (BOXWARE LIMITED), 21 December 1994 (21.12.94), page 3, line 24 - line 35; page 5, line 27 - line 38, claims 6,7, abstract --	1-11
X	US 4734851 A (DIRECTOR, DENNIS), 29 March 1988 (29.03.88), column 2, line 37 - column 3, line 30, figures 2,3, claims 1-3, abstract --	1-11
A	GB 2201992 A (LUCAS INDUSTRIES PUBLIC LIMITED COMPANY), 14 Sept 1988 (14.09.88), figures 1-5, claim 1, abstract --	2-3,5

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

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## INTERNATIONAL SEARCH REPORT

International application No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9000771 A1 (VERWEYEN GMBH), 25 January 1990 (25.01.90), page 2, line 22 - page 5, line 31, figure 1, claim 1  --	1-11
A	JP 8203257 (MITSUBISHI ELECTRIC CORP.) 1996-08-09 (abstract) World Patents Index (online). London, U.K.: Derwent Publications, Ltd (retrieved on 2000-10-27). Retrieved from: EPO WPI Database. DW199642, Accession No. 1996-417431. See the whole document  -----	1-11

# INTERNATIONAL SEARCH REPORT

Information on patent family members

03/10/00

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Patent document cited in search report			Publication date	Patent family member(s)		Publication date
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